Space Weather Forecast

Issued on Sunday, 04 June 2023 at 13:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares with a risk of Minor-Moderate radio blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, but tending towards Moderate with frequent Common-class flares observed during the last 24 hours. The main source of these have been from one large and complex region in the southeast. There is one further large region in the southwest, but this has fallen largely inactive. The remaining groups on the disc are mostly simple and inactive unipolar or bipolar regions. A large filament was seen lifting off of the southwest of the visible disc around 04/0900UTC. Its position on the solar disc relative to Earth would suggest that an Earth-directed component is possible, however coronagraph imagery is not yet available for analysis. No other Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery during the period

Solar Wind / Geomagnetic Activity: Solar winds have remained at ambient levels through the last 24 hours, although are on a somewhat erratic rising trend. Total magnetic field strength was weak, but with a sharp rise to moderate levels around 03/2300UTC and has since weakly fluctuated. The important north-south component varied weakly before reaching a positive moderate peak around 03/2300UTC, thereafter tending negative until 04/1000UTC. Geomagnetic activity was mainly Quiet with one Active KGbi interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain Low, with isolated Moderate flares likely at times. However, there are only two significant regions contributing to the flare risk, one of which is set to rotate off the disc in the next two days. Further active regions are likely to rotate across the eastern limb during the same period. Based on this analysis there is a chance of Moderate activity and a low risk of High activity.

Solar Wind / Geomagnetic Activity: There are no Earth-directed Coronal Mass Ejections (CMEs) forecast, however a recent filament lift-off is yet to be analysed. Solar wind speeds are likely to remain at slow-ambient levels. Fast solar winds from coronal holes may enhance wind speeds Days 1-2 (04-05 June), perhaps reaching 450-500km/s. Geomagnetic activity is forecast to be mainly Quiet to Unsettled (Kp0-3), with a slight chance of Active (Kp4) intervals or a G1/Minor Storm (Kp5) Days 1-2.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is an ongoing slight chance of reaching the S1/Minor Storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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